Loris Bazzani

Senior Computer Vision Scientist at Amazon

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http://scholar.google.com/citations?user=1cdNGL4AAAAJ&hl=en

Current Position

Amazon May 2018-now
Senior Computer Vision Scientist in Core ML

Previous Experience

Amazon Jan 2016-Apr 2018
Computer Vision Scientist in Core ML

Dartmouth College Jan 2014-Dec 2015
Postdoc at the Visual Learning group
- Topics: object localization and detection in images, deep learning, salience prediction
- Supervisor: Prof. L. Torresani

University of Verona Dec 2013
Research Collaborator
- Topic: object recognition
- Supervisor: Dr. M. Cristani

Italian Institute of Technology Dec 2011–Nov 2013
Postdoc at the Pattern Analysis and Computer Vision group
- Topics: semi-supervised object recognition, person re-identification and individual-group tracking
- Supervisor: Prof. V. Murino

University of British Columbia May–Nov 2010
Research Intern at the Laboratory for Computational Intelligence
- Topics: deep learning and attentional models
- Supervisor: Prof. N. de Freitas

Education

University of Verona Jan 2009–May 2012
Ph.D. in Computer Science
- PhD Thesis: Beyond multi-target tracking: statistical pattern analysis of people and groups.
- Topics: person re-identification, individual-group tracking and attentional models
- Advisors: Prof. V. Murino, Dr. M. Cristani
- Reviewers: Prof. A. Del Bimbo, Prof. R. T. Collins

University of Verona Sep 2006–Dec 2008
M.S. in Intelligent and Multimedia Systems
- Thesis topics: particle filtering and multi-target tracking
- Advisors: Prof. V. Murino, Dr. M. Cristani
- *Summa cum laude*

University of Verona Sep 2003–Dec 2006
B.S. in Information Technology
- Thesis topics: classification, MRI, and mental health application
- Advisors: Prof. V. Murino, Dr. U. Castellani

Scientific Interests

Computer Vision	Activity recognition and localization, video understanding, video representation image and video captioning, visual Q&A
Machine Learning	Large-scale learning, feature learning, deep learning, attentional models

Awards and Grants

- **IBM Best Student Paper Award**, track: Computer Vision at International Conference on Patter Recognition ICPR, 2010
- **Scholarship** from University of Verona that supported my Ph.D. from Jan. 2009 to Dec. 2011
- **Scholarship** from EU-Project FP7 SAMURAI, grant FP7-SEC-2007-01 No. 217899, that contributed to support my Ph.D. from Jan. 2009 to Dec. 2011
- **Travel grant** from University of British Columbia to attend Neural Information Processing Systems, 2010
- **Travel grant** from International Machine Learning Society to attend the International Conference on Machine Learning, 2011

Teaching

Dartmouth College Winter 2015

Machine Learning

- Tutor of the undergrad course taught by Prof. L. Torresani

Italian Institute of Technology Winter 2013

An Introduction to Machine Learning and Computer Vision

- Course for Ph.D. students
- Organized in collaboration with other members of PAVIS group

University of Modena and Reggio Emilia Spring 2011

Person Re-identification

- Person Re-identification: a recent issue for the video surveillance community and a technique for approaching it
- Held at the Short Spring School in Surveillance
- Organized in collaboration with Dr. M. Cristani

Publications

Blue color = top-tier computer vision/machine learning conferences or journals.

Person re-identification

- L. Bazzani, M. Cristani, and V. Murino. SDALF: Modeling human appearance with symmetry-driven accumulation of local features, Person Re-identification, 2014.
- D. Figueira, L. Bazzani, H.Q. Minh, M. Cristani, A. Bernardino, and V. Murino, Semi-supervised multi-feature learning for person re-identification, International Conference on Advanced Video and Signal-based Surveillance (AVSS), 2013.
- P. Salvagnini, L. Bazzani, M. Cristani, and V. Murino, Person re-identification with a PTZ camera: an introductory study, International Conference on Image Processing (ICIP), 2013.
- L. Bazzani, M. Cristani, and V. Murino. Symmetry-driven accumulation of local features for human characterization and re-identification, Computer Vision and Image Understanding (CVIU), 2013.
- B. I. Barbosa, M. Cristani, A. Del Bue, L. Bazzani, and V. Murino, Re-identification with RGB-D sensors, In 1st International Workshop on Re-Identification, 2012.
- L. Bazzani, M. Cristani, A. Perina, V. Murino, Multiple-shot person re-identification by chromatic and epitomic analyses, Pattern Recognition Letters, 2012.
- D. S. Cheng, M. Cristani, M. Stoppa, L. Bazzani, V. Murino, Custom pictorial structures for re-identification, British Machine Vision Conference (BMVC), 2011.
- L. Bazzani, M. Cristani, A. Perina, M. Farenzena, and V. Murino, Multiple-shot person re-identification by HPE signature, International Conference on Patter Recognition (ICPR), 2010.

- M. Farenzena, L. Bazzani, A. Perina, V. Murino, and M. Cristani Person re-Identification by symmetry-driven accumulation of local features, International Conference on Computer Vision and Pattern Recognition (CVPR), 2010.

Attention and Saliency

- L. Bazzani, H. Larochelle, and L. Torresani, Recurrent Mixture Density Network for Spatiotemporal Visual Attention, International Conference on Learning Representations (ICLR), 2017.
- M. Denil, L. Bazzani, H. Larochelle, and N. de Freitas, Learning where to attend with deep architectures for image tracking, Neural Computation, 2012.
- L. Bazzani, N. de Freitas, H. Larochelle, V. Murino, J. Ting, Learning attentional policies for object tracking and recognition in video with deep networks, International Conference on Machine Learning (ICML), 2011.
- L. Bazzani, N. de Freitas, J. Ting, Learning attentional mechanisms for simultaneous object tracking and recognition with deep networks, Workshop on Deep Learning and Unsupervised Feature Learning at the Conference on Neural Information Processing Systems (NIPS), 2010.

Object Recognition and Classification

- H. Q. Minh, M. San Biagio, L. Bazzani, and V. Murino, Kernel Methods on Approximate Infinite-Dimensional Covariance Operators for Image Classification, Arxiv, 2016.
- M. San Biagio, H. Q. Minh, L. Bazzani, V. Murino. Approximate Log-Hilbert-Schmidt distances between covariance operators for image classification. International Conference on Computer Vision and Pattern Recognition (CVPR), 2016.
- L. Bazzani, A. Bergamo, D. Anguelov, L. Torresani. Self-taught object localization with deep networks. In IEEE Winter Conference on Applications of Computer Vision (WACV), 2016.
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework in vector-valued reproducing kernel Hilbert spaces for manifold regularization and co-regularized multi-view learning, Journal of Machine Learning Research, (JMLR), 2016.
- M. San Biagio*, L. Bazzani*, M. Cristani, V. Murino, Weighted bag of visual words for object recognition, In IEEE International Conference on Image Processing (ICIP), 2014. (* equal contribution)
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework for vector-valued manifold regularization and multi-view learning, International Conference on Machine Learning (ICML), 2013.

Social Interaction Analysis

- S. Vascon, and L. Bazzani, Group Detection and Tracking using Sociological Features, In Group and Crowd Behavior for Computer Vision, 2017.
- L. Bazzani*, M. Zanotto*, M. Cristani, V. Murino, Joint individual-group modeling for tracking. In IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2015. (* equal contribution)
- L. Bazzani, D. Tosato, M. Cristani, M. Farenzena, G. Paggetti, G. Menegaz, V. Murino, Social interactions by visual focus of attention in a three-dimensional environment, Expert Systems, 2013.
- L. Bazzani, V. Murino, and M. Cristani, Decentralized particle filter for joint individual-group tracking, International Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
- L. Bazzani, M. Cristani, G. Pagetti, D. Tosato, G. Menegaz, V. Murino, Analyzing groups: a social signaling perspective, Video Analytics for Business Intelligence, 2012.
- M. Zanotto, L. Bazzani, M. Cristani, and V. Murino, Online bayesian non-parametrics for social group detection, In British Machine Vision Conference (BMVC), 2012.
- M. Cristani, L. Bazzani, G. Paggetti, A. Fossati, A. Del Bue, D. Tosato, G. Menegaz, V. Murino, Social interaction discovery by statistical analysis of F-formations, British Machine Vision Conference (BMVC), 2011.
- M. Cristani, G. Paggetti, A. Vinciarelli, L. Bazzani, G. Menegaz, V. Murino, Towards computational proxemics: Inferring social relations from interpersonal distances, International Conference on Social Computing (SocialCom), 2011.
- L. Bazzani, M. Cristani, and V. Murino, Collaborative particles filters for group tracking, International Conference on Image Processing (ICIP), 2010.
- M. Farenzena, A. Tavano, L. Bazzani, D. Tosato, G. Paggetti, G. Menegaz, V. Murino, and M. Cristani, Social interaction by visual focus of attention in a three-dimensional environment, Workshop on Pattern Recognition and Artificial Intelligence for Human Behavior Analysis (PRAI*HBA), 2009.

- M. Farenzena, M. Cristani, L. Bazzani, and V. Murino, Towards a subject-centered analysis for automated video surveillance, International Conference on Image Analysis and Processing (ICIAP), 2009.

Others

- G. Roffo, M. Cristani, L. Bazzani, H. Q. Minh, and V. Murino, Trusting Skype: Learning the way people chat for fast user recognition and verification, In IEEE Workshop in Decoding Subtle Cues from Social Interactions, 2013.
- S. Martelli, M. Cristani, L. Bazzani, D. Tosato, and V. Murino, Joining feature-based and similarity-based pattern description paradigms for object detection, In International Conference on Pattern Recognition (ICPR), 2012.
- M. Cristani, G. Roffo, C. Segalin, L. Bazzani, A. Vinciarelli, and V. Murino, Conversationally-inspired stylometric features for authorship attribution in instant messaging, In ACM Multimedia, 2012.
- L. Bazzani, M. Cristani, M. Bicego, and V. Murino, Online subjective feature selection for occlusion management in tracking applications, International Conference on Image Processing (ICIP), 2009.
- D. Bloisi, L. Bazzani, and V. Murino, A comparison of particle filter-based and Kalman filter-based approaches in multi-target tracking, IEEE International Workshop on Performance Evaluation of Tracking and Surveillance (PETS), 2009.
- U. Castellani, L. Bazzani, D. Tosato, V. Murino, C. Rambaldelli, C. Perlini, M. Atzori, M. Tansella, and P. Brambilla, A learning by example approach for MRI analysis of human brain in the context of mental health, Joint Annual Meeting ISMRM-ESMRMB, Berlin 2007.

Coding

Selected Contrib.	Image to text module in Sockeye can be found here.
Programming	Python (> 4 years), MATLAB (> 6 years), Lua/Torch7 (> 1 year). Some experience with C/C++.
Tools	Linux, emacs, git, LATeX, bash scripting.

Reviewing Activity and Others

Journals	IEEE TPAMI, IJCV, IEEE Transactions on Multimedia, IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Systems, Man and Cybernetics - Part B, Pattern Analysis and Applications, Image and Vision Computing, Transactions on Information Forensics & Security, PLOS ONE, Neurocomputing.
Conferences	NIPS, ICML, CVPR, ICCV, ECCV, BMVC, IROS, ICRA.

Reference List

- **Lorenzo Torresani**, Dartmouth College, Hanover, NH. Supervisor of the postdoc at Dartmouth College. lt@dartmouth.edu. Phone: +1 603 646 3048.
- **Vittorio Murino**, Istituto Italiano di Tecnologia, Genova, Italy. Advisor of the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia. vittorio.murino@iit.it. Phone: +39 010 71781 504.
- **Nando de Freitas**, University of Oxford, Oxford, UK. Supervisor during the intership at the University of British Columbia. nando@cs.ox.ac.uk. Phone: +44 186 561 0764.
- **Marco Cristani**, University of Verona, Verona, Italy. Collaboration during the PhD at University of Verona and the postdoc at the Istituto Italiano di Tecnologia. marco.cristani@univr.it. Phone: +39 045 802 7988.
- **Hugo Larochelle**, Université de Sherbrooke, Sherbrooke (QC), Canada. Collaboration for the attentional modeling project. hugo.larochelle@usherbrooke.ca. Phone: +1 819 821 8000.